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PLUS GRAPH

TRI MICRO

PLUS GRAPH

A Grapics Package for the C-64 or Plus 4

By: David W. Johnson
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PLUS GRAPH
An Introduction

The PLUS GRAPH program is a high resolution business graphics package. It will allow you to make line graphs, bar charts, and pie charts. Full editing capabilities are available, so that you can incorporate text into your charts and edit the graphics. In the mode called ´bit map mode´, you can also draw lines from point to point, draw circles, and fill shapes. The amount of data allowed for each type of graph is:

1. Line Graph -- Plots up to 3 sets of data (variables), containing up to 50 values (elements) per variable.

2. Bar Charts -- Plots up to 3 variables of up to 12 elements each.

3. Pie Charts -- Plots one variable with nine data elements.

To work with PLUS GRAPH, you need the following equipment:

1. A Commodore 64 or a Commodore Plus 4 computer. The program will determine which machine it is in and will adjust itself accordingly.

2. A Commodore 1541 disk drive or other 1541 compatible drive.

3. A Commodore monitor or TV.

4. A Commodore 1525, 1526/802, or 801 printer.

Before loading the program, you need to format blank disks for your use in saving the files you create. To format a disk, insert the disk labeled PLUS GRAPH into the disk drive with the label facing you.

Type **LOAD´´DISK´´,8.**

The screen will display a LOADING followed by a READY message.

Type **RUN.**

The screen displays:

Disk Functions

[1] Rename File

[2] Format New Disk

Press 1 or 2

Press **2.**

A warning is displayed cautioning you that you will destroy all data on the disk you are about to format. Since you do wish to continue,

Press **y.**

The screen asks you to enter disk name. Enter **demo** and press RETURN. You can enter any name up to sixteen characters. Respond to the message asking for a two digit i.d. number with 01 and press RETURN. This identification number should be a unique number for each disk which you prepare. The drive light will be on and the drive will make a whirring sound as the disk is formatted. Once this is done, you are ready to load the program.

ADDENDUM

IMPORTANT! PLUS 4 COMMANDS

Editing Window -- Command Mode

Since the Plus 4 uses the f1 key for initiating the built-in software, command mode with the Plus 4 is accessed by holding down the Commodore Logo key (C=) and pressing the C key. You will use this command frequently in program operation.

C= + C **Enters command mode.**

To view a listing of the various commands and their function, you can hold down the Commodore Logo key and press the H key.

C= + H **Help function listing commands.**

Graphing Window -- Editing and Commands

To draw a circle around a point set with Logo 1, position your cursor the same distance from the point as the length of your desired radius. Hold down the CONTROL key and press the C key.

CTRL + C **Draws circle around position drawn with Logo 1 on the Plus 4.**

Disk Utilities

To load the Plus 4 backup program, type:

Load´´Plus/4 Backup´´,8.

The screen will instruct you on the correct procedure for backing up your data disks. Always back up your data disks to avoid loss of data.

Plus 4 Program Fix for Built-In Software

The data base in early Plus 4 computers contains a problem in the file manager which only appears if you have more than 250 records. When you load the Plus Graph program for the Plus 4 computer, a menu will appear. Selection 2 on the menu is LOAD FIX. To use this ´´fix´´, press 2.

The built-in software will be activated with the fix in computer memory so that the problem is not visible to you. You will need to activate the built-in software with Plus Graph menu selection 2 with each file manager use to avoid the problem. In other words, instead of pressing f1 on the Plus 4 to activate the software, you will first load Plus Graph, and press 2, to activate the software.

PLUS GRAPH

PLUS GRAPH accepts data in various formats. You can create and save your own data with the program. You can also read already created files prepared with the spreadsheet of either the DESKTOP or HOME OFFICE. If you have data which has been prepared with other spreadsheet programs, this data can be read by PLUS GRAPH as long as the spreadsheet with which you worked has the ability to make its data ASCII files.

PLUS GRAPH has two screen windows. The first of these is the data editing window, where you can enter data and commands. The second is the graphics window, which displays the charts created and allows you to edit or label these charts.

Certain program operations require that you use special keys. Function keys are referred to by ´fn´, with ´n´ being the number of the function key. The Commodore Logo key is referred to by C=. The Control key is referred to by CTRL followed by the letter required. A help list is included for your reference which outlines the proper syntax or usage for each function.

When the program first loads, a matrix will appear displaying 3 columns with 20 rows. The intersection of a row and column is known as a cell. Each cell will be filled with zeroes. We will call this screen the **data editing window** .

The prompt at the bottom of the screen displays **N>** .

The ´N´ signifies that you are in numeric mode. Type 10000 and press RETURN.

You will see that 10000 is displayed in the first row and first column (1;1). It will also appear after the prompt, N> 10000. You may change the value of any cell by typing a number and pressing RETURN. To move to another row and column position use the cursor or function keys. These keys are labeled:

CRSR f7/f8

To move down a row, press the **CRSR** key with the up/down arrows. To position the cursor in the second column, moving to the right, press **f7.**

To move up a row, hold the **SHIFT and press the up/down CRSR** key.

Now, to move to the first column you simply press **f8** . Anytime that you are in numeric mode, you can use the cursor keys and function keys to move to the desired column or row in the data editing window.

----------COMMAND MODE----------

f1 Enter Command Mode

To change the number of rows and columns in the data editing window, you must be in command mode. To access command mode, press **f1.**

The prompt line at the bottom of your screen changes to a **C>.**

Type **rows5; and press RETURN .**

The prompt has returned to N>, but we still need to change the number of columns. Press f1, type **cols1; and press RETURN.**

Your editing window will now display only one column of 5 rows. Note that whenever you enter a number while in command mode, a SEMI-COLON (;) must follow the number. To specify the number of rows, the proper command is ROWSnn, with ´nn´ being any number up to 50. To specify the number of columns, the proper command is COLSn, with ´n´ being any number up to 3. When using either numeric mode (N>) or command mode (C>), you will notice some movement of the prompt [Help on f3 key]. This is a normal program operation.

Using your cursor, position yourself in the second row. Now, type the following:

-20000 and press RETURN. Cursor down.
30000 and press RETURN. Cursor down.
-40000 and press RETURN. Cursor down.
50000 and press RETURN. Cursor down.

EDITING WINDOW
COMMAND MODE

---

rowsn;	**sets rows to ´n´ number**	**f1**	**command mode**
colsn;	**sets columns to ´n´ number**	**id**	**initialize disk**
ca	**catalog of files on disk**		
	sf´filename´	**save data file**	
	sp´filename´	**save picture file**	
	lf´filename´	**load data file**	
	lp´filename´	**load picture file**	
pie	**draws pie chart**	**bar**	**draws bar chart**
graph	**draws line graph**	**f3**	**help list**
bits	**enters graphics**	**reset**	**cold start**

***p prints data from editing window**
ptype 1; sets printer type to 1525/MSP 801
ptype 2; sets printer type to 1526/MSP 802

You have already been introduced to the command mode. When in this mode you can define your editing window, draw graphs, save files and pictures, perform program utilities, and enter bit map mode.

Creating Graphs

Press f1, type **graph** and press RETURN. The screen clears and a line graph will appear. We will call this screen the **graphics** window, in which all graphics will be displayed. In the lower right hand corner of the screen you will see a blinking horizontal line. This is the cursor in bit map mode. This graph is shown on the following page as ´´GRAPH1 PRODUCED BY GRAPHDEMO.´´

Since you need to save the file and the picture just created, you must return to the data editing window. To do this, press f1. Notice that your data is still in the column. Insert the formatted data disk prepared with the utility program described in the section ´´Disk Utilities´´.

You are now in command mode. Since you have inserted a new disk in the drive, it is a good idea to initialize the drive.

Type **id and press RETURN** .

The disk initialization command should be used when inserting a new disk in the drive or if the drive seems to be in a strange state. To save the data you typed previously,

Type **sf´graphdemo´ and press RETURN.**

To save the chart created with the data you just saved,

Type **sp´graphl´ and press RETURN.**

If you had created multiple files, you might need to catalog the disk to see which files were on the disk for your use. To see a listing of the files,

Type **ca and press RETURN.**

You will see the files you just saved as below:

graphdemo.f
graphl.p

The program places a ´.f´ after the name to signify a data file and a ´.p´ to signify a picture file. **Press RETURN** to return to the data editing window. After a catalog of the disk, you will find yourself back in numeric mode. Return to command mode by pressing **fl.**

Type **reset and press RETURN.**

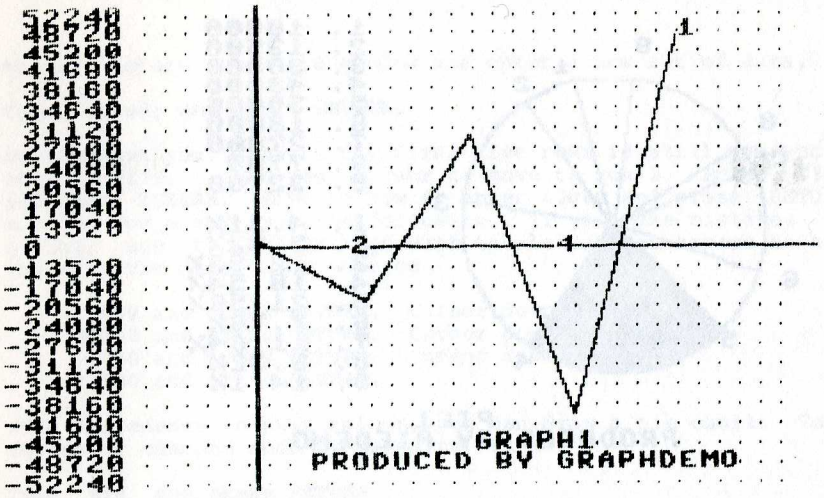
This will cause a cold start of the program. A cold start has the same effect as if you turned off the computer and re-loaded the program. Your screen will again display the title page followed by the data editing window of 3 columns and 20 rows with zeroes.

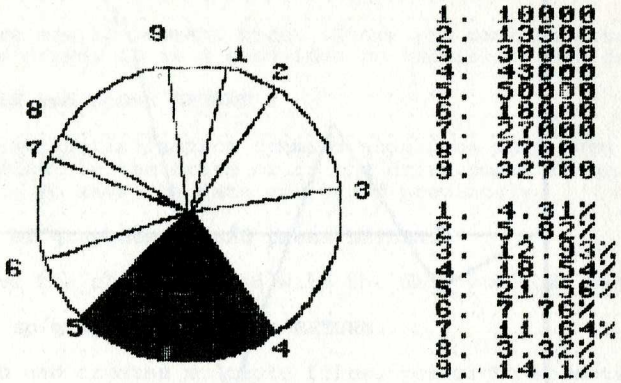
The files you saved can still be recalled. To load the files, enter command mode by pressing fl. To load your data file,

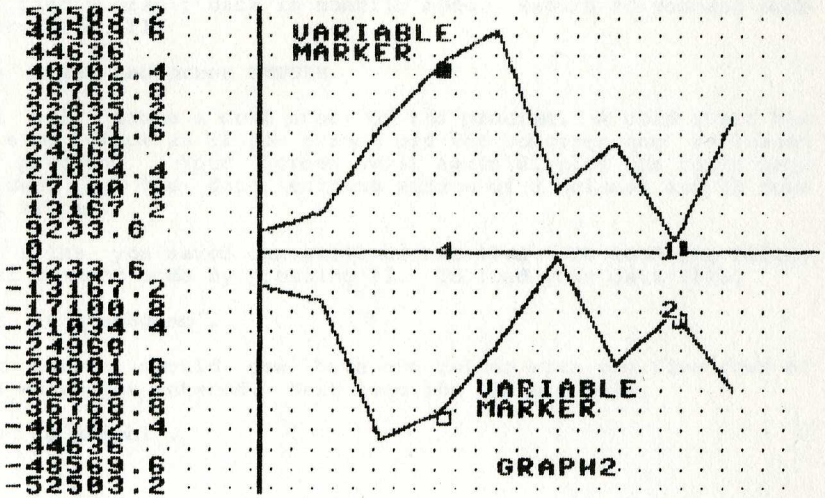
Type **lf´graphdemo´.**

Your screen should now have one column with the five rows of data which you entered. Next load the picture file,

Type **lp´graphl´.**







To restructure your data window and enter a new set of data,

Type **rows9; and press RETURN.**

Notice that your data in the first five rows is still present in these cells. Use your cursor to move to row 2. Enter 13500 and press RETURN. Move to row 4, enter 43000 and press RETURN. Move to row 6 and type the following. If you make mistakes in typing, use the CURSOR keys with the left/right arrows to help you edit the data being entered.

18000 and press RETURN. Cursor down.
27000 and press RETURN. Cursor down.
7700 and press RETURN. Cursor down.
32700 and press RETURN.

With 9 elements in this column, you can draw a pie chart. To do so, enter command mode by pressing **f1** .

Type **pie and press RETURN** .

The graphics window will now display a pie chart. Use the f1 key to return to the data editing window. Enter command mode and save the data file under the file name ´piedemo´. Save the picture file under ´piel´. The graph labeled ´´PIEl PRODUCED BY PIEDEMO´´ is shown on the preceding page.

Type **rows5; and press RETURN.**

Type **rows9; and press RETURN.**

Notice that your data stays in memory. Although the last four rows disappear with the first change of matrix command, when the window is re-configured, the data in these rows is still visible.

Type **cols2; and press RETURN.**

Cursor to the first row in the second column and type the following.

-12300 and press RETURN. Cursor down.
-15300 and press RETURN. Cursor down.
-43000 and press RETURN. Cursor down.
-37500 and press RETURN. Cursor down.
-23500 and press RETURN. Cursor down.
- 5300 and press RETURN. Cursor down.
-28000 and press RETURN. Cursor down.
-18000 and press RETURN. Cursor down.
-33800 and press RETURN. Cursor down.

Press f1, type **graph** and press RETURN.

Reference the line graph labeled as ´´GRAPH2´´ on the preceding page. You will notice that the line representing the second column of negative values is marked by a □ . The lines are marked to help you differentiate the graphing of one variable from another. The symbol for the third variable should you have a graph with three variables is ■ . Return to the editing window by pressing **f1.**

Press f1, type **bar** and press RETURN.

A bar graph is now displayed. Notice that the first variable or column is solid black while the second column or variable is white outlined in black. If you had a third variable or column, this bar would be cut diagonally, half black and half white. This chart, BAR1, appears on the following page.

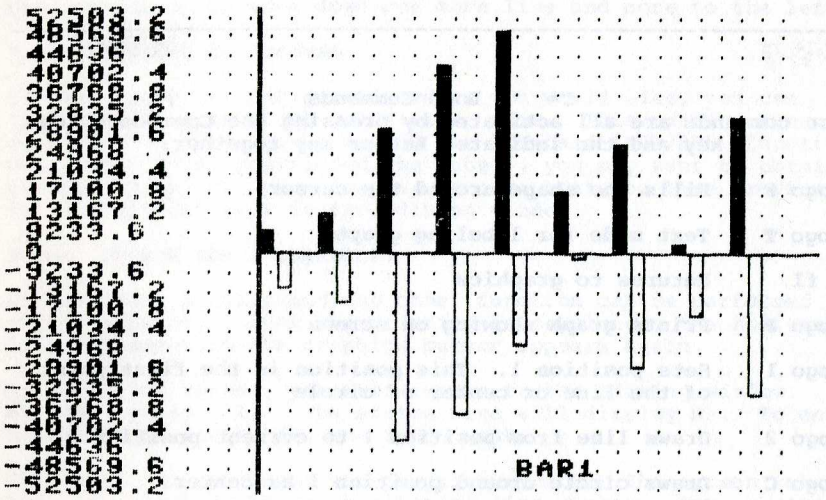
Return to the editing window by pressing **f1.**

Press f1 again. Save the data under the filename ´bardemo´ and the picture under ´bar1´.

You may print the matrix data. Before doing so, you need to set the printer type. Press f1.

If you are using a 1525 or an MPS 801, type **ptype 1;** . If you are working with a 1526/MPS 802, type **ptype 2;** . Now that your printer type has been identified, you are ready to print. Type *p.

The next section will review the functions available to you in the graphics window. When printing has completed, enter the graphics window by typing **bits.**



GRAPHING WINDOW
EDITING AND COMMANDS

C= Logo Commands

These commands are all activated by pressing the Commodore Logo key and the indicated Letter key together.

Logo F	**Fills the shape around the cursor.**
Logo T	**Text mode for labeling graphs**
f1	**Returns to graphics**
Logo P	**Prints graph showing on screen**
Logo 1	**Sets position 1. This position is the first point of the line or center of circle**
Logo 2	**Draws line from position 1 to current position 2.**
Logo C	**Draws circle around position 1 as center.**

DRAWING COMMANDS

The commands can be used to draw in the direction indicated or to draw indicated shape. Press the letter of choice.

R	**Draws right**	**B**	**Draws bar graph**
L	**Draws left**	**G**	**Draws line graph**
U	**Draws up**	**P**	**Draws pie graph**
D	**Draws down**		

The graphics window displays the bar graph which you just created. Since the graph has no identifying labels, we need to enter the text mode to label it.

Press the **C= and the T together.**

A solid black square appears, replacing the blinking horizontal line cursor of the graphics mode. Use the cursor keys to position yourself below the graph and slightly to the left of center.

Type **barl.**

Use the cursor to move down one more line and more to the left.

Type **produced by bardemo.**

If the labels are not positioned as you would like, you can use the INST/DEL keys to move the text. This editing function operates in the same way as the standard INST/DEL function. Once you have positioned the labels, you may want to obtain a printed copy of your graph. Be sure that you have previously set the printer type in the editing window.

Press **C= and the P together.**

As the graph is printing, no other function can be performed on your computer. When the printing is completed, the horizontal line representing the graphics cursor appears again.

To erase the screen, you must return to the editing window. To do so, press f1. The status line will display N>. To enter command mode, press f1, and type **wash.**

Type **bits** to return to the graphics window. The screen should now be blank with a horizontal line cursor. Type u several times to make a vertical line will appear in an upward direction. To make a horizontal line, type either l or r, depending on the direction you desire, left or right. If you wish to draw in a downward direction, type d several times.

Drawing lines by using the **u,d,l,r** keys can be slow. A faster method of drawing lines from one point to another is to use the Logo 1 and Logo 2 commands. Move the blinking horizontal line cursor to another place on the screen. To mark the beginning point of the line,

Press **C= and the 1 together.**

Now move the cursor to another position on the screen and

Press **C= and the 2 together.**

A line will connect the two points. This line may be vertical, horizontal, or a diagonal. Using the Logo 1 and 2 to draw lines gives you the ability to create complex shapes quickly.

Notice that the movement around the screen utilizing the graphics horizontal line cursor is significantly slower than using the text solid black cursor. For rapid movement, switch from the graphics cursor to the text cursor and back to the graphics cursor.

The Logo 1 is also used to mark the center of a circle you might want to draw. To establish the radius of the circle, move the cursor the desired distance from the center point marked with Logo 1.

Press **C= and the C together** . A circle will be drawn around the point which you marked with Logo 1. If the circle exceeds the boundary of the screen, you will obtain vertical lines at the screen boundaries. Therefore, be certain to position your center (Logo 1) and radius in such a way as to allow sufficient room for the size of circle you wish to draw.

If you want to fill the shapes you are creating, position your cursor within the shape and press **C= and the F together.**

The shape will fill. In some instances, some space may still remain blank. Keep repositioning your cursor and using the fill command to fill the shape completely. The fill command will break through the shape if the boundaries of the shape have any open space. You may use this fill command to color in alternating wedges of pie charts created from data. You may also use it to highlight the most prominent wedge in a pie chart.

It is also possible to draw a bar, pie, or line graph directly in graphics mode. Return first to the editing window and use the **wash** command to clear the screen of your pictures. Type in **bits** to re-enter graphics mode. To create a line graph of the data, press **G.**

A line graph will appear identical to the one you created earlier with the editing window **graph** command.

To create bar graphs, press **B.**

To create pie graphs, press **P.**

EDITING WINDOW
ADDITIONAL COMMANDS

clear	**clear data from matrix**
df´filename*´	**delete data or picture file from disk**
manual	**allows you to set min and max values for graph scaling**
auto	**returns to auto scaling**
integer	**sets all data values to integers for graph values**
float	**sets all data values back to floating point for graph values.**
copy n; n; n;	**copies values in column ´n;´ from row ´n;´ to row ´n´ -- begins copying from cursor placement**
rotate	**moves column 1 data to column 2; column 2 to column 3; column 3 to column 1**

There are additional commands available to you in the editing window. To clear the data values from your matrix, press f1 and type **clear.** Previous values are replaced with zeroes.

If you want to delete either a data file or a picture file, use the **df´filename*´** command. The asterisk is placed after the filename so that the program will delete both file types, with either the ´.f´ or the ´.p´ suffix.

You may have noticed that PLUS GRAPH automatically scales your graphs, setting the step values according to the data which you input. With auto scaling, the first step, or increment of value, is an expanded scale so that smaller values will appear on the graph. This mode is applicable when you have data with a wide range of values, from 100 to 100,000, for example.

Use the **lf´filename´** command to load the file known as ´bardemo´. Let´s make some changes to the values in the first column. Change 10,000 to 100, and change 50,000 to 100,000. Press f1 and type **bar.**

In the chart labeled BAR2, you will notice that the bar representing ´100´ is visible, although bars representing other smaller values are out of proportion to ´100´. The bar representing the value 7700, for example, is not graphically 77 times larger than the bar representing the value 100, nor is it correctly proportioned to the first step value.

Without the expanded scale for the first step, the value of 100 would not show up on the graph. With the expanded scale, all values regardless of size will appear. This expanded scale has the effect of visually distorting those values which fall below the first step, although the remaining steps are in even increments. To eliminate this distortion, you have the option of manually scaling the graph to your own minimum and maximum values. For an example of manual scaling,

Type **manual** .

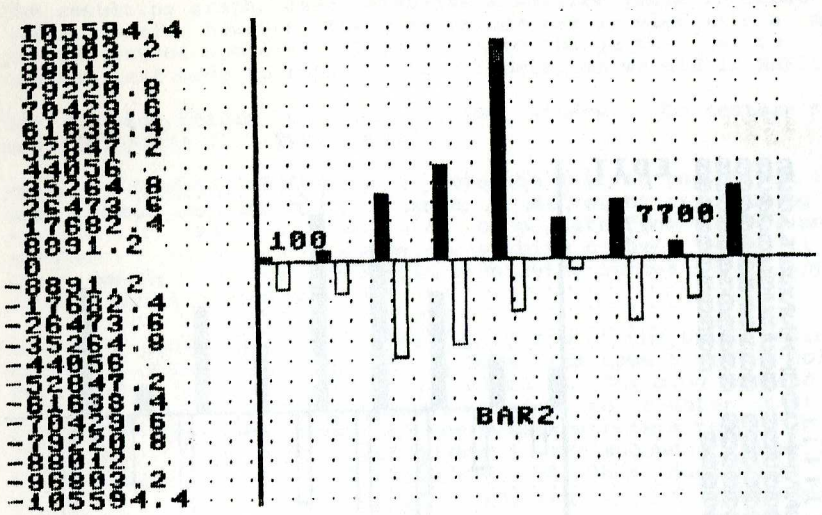
Type **bar** .

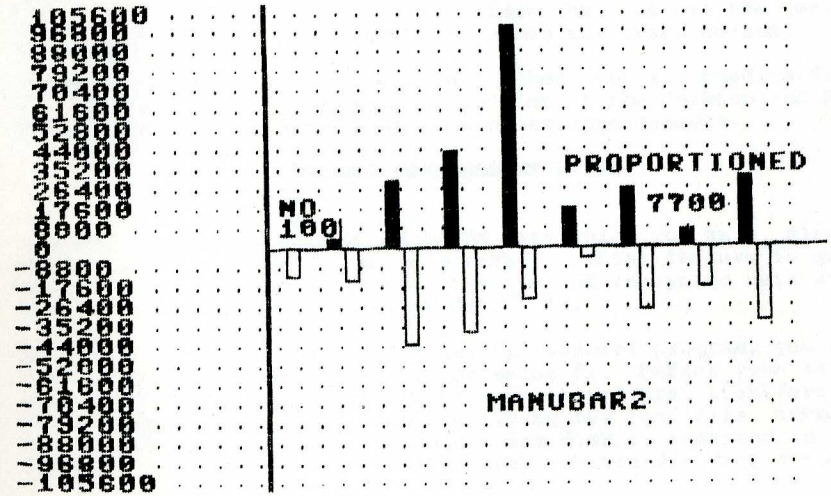
The status line will now prompt you for the maximum value. Type 100000. The next prompt asks you for the minimum value. For a true relative graphic representation, always set your minimum value at zero (0). Type 0. Refer to the chart labeled MANUBAR2 and you will see that no solid block exists for the first value of 100, although the proportions between values is accurate. To create your own expanded scale so as to ´´blow-up´´ a particular range of data, set your minimum and your maximum values to the top and bottom of the range using manual mode.

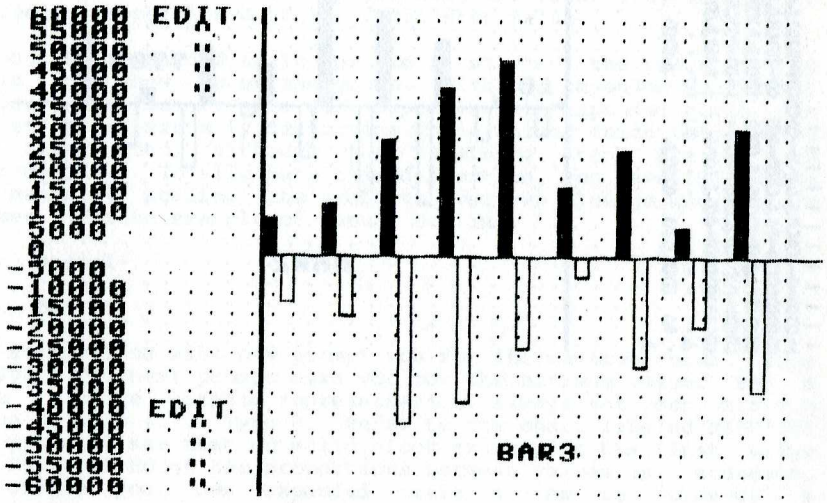
To create the largest physical representation on the screen, the program sets the top step to an approximately 5% greater value than the maximum value. The values of the steps will often be displayed as oddly spaced increments. If you want to label the step values with rounded numbers, first choose integer mode. To select integer displays in the graphics window. Press f1 and type **integer.**

Reset your values by typing 10000 to replace the 100 and by typing 50000 to replace the 100000. You are still in manual mode. Once you select a mode it can only be turned off by selecting the alternate mode.

Determine the maximum value you would like to see in the graph. Select a number which is a multiple of twelve that is the next highest value greater than that desired maximum value. Because the vertical scale is divided by twelve units, this number must be divisible by twelve. Multiply this number by .947. Enter the result as the maximum value. Set the minimum level to zero (0) as before.







The resulting graph, BAR3, displays a smaller graph in terms of overall scale, however, the step values are labeled with a more rounded set of numbers. If you want to change the ´1s´ to ´0s´ use the text mode to replace these labels, as we did in BAR3.

Use f1 to return to the editing window. To restore auto scaling, press f1. Type **auto** .

Certain commands allow you to move the data in the matrix from one column to another or into a different row. Using our example of ´bardemo´, we will copy data from one column to another. First we will define a third column. Press f1 and type **cols3;** . A third column displaying zeroes should appear on your editing window.

Position your cursor in the third row of the third column. Press f1, type **copy 1; 5; 7;** . Data from rows 5 to 7, column one, copies to rows 3 through 5, column 3. The copy command is useful in moving data without having to re-enter it at the keyboard. The first number in the sequence refers to the column you want to copy. The second number in the sequence identifies the row from which you begin copying. The third number in the sequence is the last row which you want copied. The copying occurs from your cursor position down.

Suppose that you wanted to move an entire column to a different position. You might want to put gross profit figures in the first column instead of in the last column. To do this, you can use the rotate command.

Press f1, type **rotate.** The data from the third column is now in the first column, the first column has become the second column, and the second column has become the third column.

The rotate command is necessary when you are reading files prepared with the spreadsheet portion of the Desktop and HOME OFFICE, or ASCII files prepared by other spreadsheets.

READING SPREADSHEET FILES

You can create a matrix which reads data which you have already prepared with spreadsheet programs. This feature is quite useful as it can save you the time of re-typing data which already exists in a spreadsheet data file.

To read a file created with any spreadsheet program, you must first be in command mode by pressing f1. Define your matrix size to the size of the information which you are transferring. Enter command mode again. Before typing the load file command, be certain that the spreadsheet data disk is inserted in the drive. Regardless of whether you are transferring a row or

column of information, the data will be stored in a column in PLUS GRAPH´s editing window matrix.

DESKTOP or HOME OFFICE SPREADSHEET

The proper command is **13´name´ r;c to r;c** . The ´13´ tells the program to read a Desktop or HOME OFFICE file. Within the quotation marks, type in the filename of the spreadsheet file. The first ´r;c´ refers to the beginning row and column position of the range of data. The second ´r;c´ refers to the last row and column position of the range of data.

The first transfer of data will appear in column one. You must move this data over in order to transfer a second row or column from the spreadsheet. Type **rotate** . The data is now is column 2 and column 1 contains zeroes. Repeat the 13´name´ r;c to r;c.

If you wish to transfer a third set of data, you must rotate the information again to clear the first column. Repeat the load command.

A typical sequence might be:

Press **f1** .

Type **rows10;** .

Press **f1** .

Type **cols3;** .

Press **f1** .

Type **13´budget´ 1;2 to 1;11** .

Press **f1** .

Type **rotate** .

Press **f1** .

Type **13´budget´ 4;2 to 4;11** .

Press **f1** .

Type **rotate** .

Press **f1** .

Type **13´budget´ 15;2 to 15;11** .

ASCII FILES from OTHER SPREADSHEETS

Consult the manual for your spreadsheet program for instructions on creating a standard ASCII file of your spreadsheet data. Some programs automatically save their data in standard ASCII format. Other programs require that you define and save a new file of data in ASCII format.

PLUS GRAPH only reads fifty sequential records. Therefore, if you are planning on transferring data from a spreadsheet you must define which data you want to transfer. For example, assume you have a spreadsheet with rows labeled ´Gross Income´, ´Total Expenses´, and ´Net Profit´. There are other rows between these three rows. Each row has 25 column entries across the spreadsheet.

If you attempt to read the entire spreadsheet ASCII file with PLUS GRAPH, only the entries in the first two rows will be read (2X25 = 50). These rows may not be the rows you wish to graph.

Using the delete commands in your spreadsheet, create a separate ASCII file for each row you wish to graph. When you finish this procedure, you will have three separate files, one for ´Gross Income´, one for ´Total Expenses´, and one for ´Net Profit´. Each file will contain 25 sequential records (the twenty five column entries). Do not include the column of labels in your files -- create your files with the numeric data only.

Once these three separate data files have been created with your spreadsheet, define your matrix in PLUS GRAPH´s editing window as 3 columns and 25 rows. To load in each ASCII file, the proper syntax is **la´name´**. The ´la´ signifies ´load ASCII´ while the ´name´ refers to the filename you have given to the ASCII files.

After typing in the **la´name´** command, you will see the first set of data appear in the first column of the matrix. Again, use the **rotate** command to move the data to column two, leaving column one free to receive data from the second ASCII file. The sequence is the same as for Desktop or HOME OFFICE files, with the different load command.

Note: Some spreadsheets append the notation, **.a** , to an ASCII fifle. Some do not. PLUS GRAPH will only recognize as an ASCII file a data file having the notation, **.a** . After creating the files you need with the spreadsheet program, catalog your disk to see if the files bear this notation. If they do not, you will need to use the **Rename File** utility described in the next section to add this notation to the file name.

DISK UTILITIES

The utility program allows you to format data disks and rename files. To load the utility program,

Type **Load´´DISK´´,8**

The screen will display LOADING followed by a READY message.

Type **RUN.**

The screen displays:

Disk Functions

[1] Rename File

[2] Format New Disk

Press 1 or 2

To rename a file, insert your data disk.

Press **1.**

The screen will ask you **Old Filename?** . Type in the old filename, such as **grossincome** . Press RETURN. The screen now asks you for **New Filename?**

Type in the new filename, such as **grossincome.a** . Press RETURN. Your file will then be renamed.

To format new data disks, insert the disk in the drive.

Press **2.**

A warning is displayed cautioning you that you will destroy all data on the disk you are about to format. Since you do wish to continue, press Y.

The screen asks you to enter disk name. Enter demo and press RETURN. You can enter any name up to sixteen characters. Respond to the message asking for a two digit i.d. number with 01 and press RETURN. This identification number should be a unique number for each disk which you

prepare. The drive light will be on, and the drive will make a whirring noise as the disk is formatted.

BACKUP DATA DISKS

Since you will be creating data disks with PLUS GRAPH and other programs, you may want to create copies of these disks in case the original disk is erased or becomes worn from use. The backup programs included with PLUS GRAPH will backup any data disks, not just PLUS GRAPH data disks.

The backup program for use with the Commodore is called 1541 BACKUP. To load this program,

Type **Load´´1541 Backup´´,8** . Once the program is loaded the screen will instruct you on the procedure for backing up your disks.